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Over 200 children were tested to determine whether, of prospective first grade pupils, the 257 scoring lowest on tests of visual-motor-perceptual development would also be clustered in the lowest third of first grade performance on word recognition skills at the end of the year. Tests given upon entrance were the Peabody Picture Vocabulary Test, the Walking Board Motor Ability Test, the Winter Haven Form Copying, Visuals I, and Ocular Motility. Tests given in May were the Winter Haven, Visuals III, the Gates Primary Word Recognition, and California Low Primary Reading Test and Letter Matching Form. (Tests were also administered in March.) The Winter Haven was the best predictor of reading achievement with a correlation of .45 with composite reading scores, and 32 (67%) of the bottom 48 scorers on the Winter Haven were among the lowest 65 scorers on reading on the Gates Test. To evaluate modifiability of perceptual skills and their relation to reading abilities, 14 children who scored poorly on the pretests were assigned to two treatment groups. One group received daily 20-minute visual-motor-perceptual training and the other group did not" The groups were combined for reading instruction for 5 weeks in the spring. Learning improvement from March to May because of visual-motor-perceptual training was significant at the .05 level. (LE)

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REPORTING OF PROJECT S-455, OE-6-10-144

A SUGGESTED METHOD FOR PRE-SCHOOL IDENTIFICATION OF READING DISABILITY

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ED025055

A Suggested Method
For Pre-School Identification
Of Potential Reading Disability

Problem

For years public school teachers, neurologists, psychologists, sociologists, child development laboratories, optometrists and reading specialists have been describing a certain kind of child demonstrating the same basic syndrome. Ilg and Ames (14) at Gesell Institute of Child Development term this potential reading disability case "reality bound." The neurologist or pathologist suggests "minimal brain dysfunction" or "specific dyslexia" or "partial aphasia," while others call him "sub-clinical." Psychologists consider him perceptually handicapped; the school administrators feel that he is not trying; the sociologist identifies him as a school drop-out; and the welfare worker sees this child as a part of her future case load. The classroom teacher comments variously that he is a "slow-learner," or that he has the ability if he "would," or that he's clumsy and that she can't seem to help him keep pace with learning--even though he's had two years in each grade. Her commonest descriptive phrase is "immature." He starts behind and remains behind, with the gap widening between him and his fellows, and with his yearly increments of learning becoming even less. Not infrequently the yearly measures show not gain, but retrogression. Without early identification and remediation, this child becomes a part of a national problem, the school drop-out, and accumulates many contingent problems.

Related Literature

In the 1930's investigation of factors of reading readiness began to be of concern. It was commonly accepted that a child must be able to see and to hear to be ready to make normal reading progress in a public school setting. Being able to see with fair acuity, plus normal hearing, plus average intelligence indicated a total of ability to learn to read in a public school.

During the early period of the 1920's and 1930's, a number of studies of the visual ability the child must have for reading readiness were reported. The turn toward the concept of a more specific factor of visual perception came with the work of the Thurstones (29), who believed perceptual abilities to be a composite of many functional unities. Application of factor analysis of perceptual abilities to learning problems had begun to increase.

The 1940's continued to find more careful examination of primary mental abilities. The War, and the need to train people in

visual perceptual abilities for war purposes, opened the door further for training techniques. Some of these findings were used by Jean Goins (11), who later found that scores on pattern copying, reversals, and a combined perceptual score had the highest correlation with reading achievement. Two factors of visual perception identified in the relationship were the ability to keep a figure in mind against distraction and the ability to hold a Gestalt in mind during rapid perception. She found some further evidence for distinct types of perceivers. Tachistoscopic visual-form training proved helpful only to the initially superior groups and showed no positive effect on the reading skill of the whole group. King (17) followed these experiments in the 1960's with investigation into different kinds of visual discrimination training in their effects on learning to read words.

It was not until the late 1950's that journals of pediatrics, education, sociology and psychology began to publish papers of research using such approaches as "specific reading disability," "specific dyslexia," "perceptual handicap," "equivocal neurological symptoms," or"psychomotor deficit." All began to identify neurological and visual functions as specifically related to reading disability. Most of this research was done with children already suffering from reading disability. Group predictors and readiness tests used minimal or no form reproduction, body image, neurological or visual coordination test items. Delacato (5), Kephart (16), Ilg and Ames (14), Getman (10), Bryant (3) and others turned their attention to factors which might account for dyslexia. In varying degrees, all found these children had difficulties in form reproduction, lacked normal orientation of body image, and exhibited neurological symptoms accompanied by visual pursuit or Gestalt functioning abnormalities. Still others found age of entrance into formal school to be of significance when developmental levels were examined. One of these was Inez King (18).

Kawi and Pasamanick (15) found indication that a relationship existed between abnormal conditions in childbearing and subsequent development of reading disorder. Ayres (1) commented on the "neuro-physiological mechanisms" and their relationship to perceptual-motor dysfunction.

Frances Ilg and Louise Ames (14) have been doing wide research in relation to school readiness and reading problems. They have recently published a developmental examination identifying necessary components for reading. Further experimentation is in progress in public schools now.

Kephart (16) takes the view that neurological development and visual perception must be examined as a part of reading

readiness diagnostics. Money (23) brings together many aspects of neurological and visual dysfunction as causation in reading failure. Getman (10) has developed a manual for teaching physiological readiness for the developmental learning process. Frostig (8,9) also has published a manual for perceptual training. Haeussermann (13) included evaluation of intellectual, sensory and emotional functioning with items of ocular pursuit and neurological development.

Kolson and Kaluger (19) urge an early identification and moderation of primary reading disabilities. In their rationale they include attempts at early identification through study of neurological and eye movement development. They also discuss the problems of laterality, directionality, and perceptual training. Strauss (26,27) added to knowledge through his educational pursuits with the brain-damaged. Weiner and Feldmann (7) are attempting to validate their reading prognosis test which takes about 25 minutes per child administered by a classroom teacher. Barrett (2) reports "reading letters" to be of highest significance in predicting first grade achievement. Pattern copying was found to demonstrate most adequately its value in predicting word recognition skill. Reversals also showed definite rank. The public schools of Winter Haven, Florida, have also done extensive research in testing and training perceptual abilities as being predictive of and necessary for reading ability.

Of significance in the application of the theory of such investigators are the programs of perceptual training at Brentwood, New Jersey (12); Winter Haven, Florida; Baltimore, Maryland; Cleveland, Tennessee; at the Frostig School of Educational Therapy in Los Angeles; and further experimentation by Gesell Institute in public school settings.

Objectives

The study attempted to identify the first grade child who was not yet ready for reading through the use of procedures that would reflect his visual-motor-perceptual development. The investigators had observed that this development was replicated in the child's reading behavior. Specifically, they hypothesized that the one-fourth of the prospective pupils with the lowest scores on the pre-testing would also be clustered in the lowest third of the first grade performance on word recognition skills at the end of the year.

The investigators also sought to evaluate the modifiability of perceptual skills and their relation to reading abilities through experimentation with a visual-motor-perceptual training

program with seven children who scored poorly on the pre-testing tasks. A cross-section of I.Q. was used to reflect a cross-section of the classroom make-up. A second phase of the experiment added seven more children to the first group for five weeks of reading activities. These groups were compared with each other and with controls to determine the efficacy of the training program plus the additional reading activities.

Procedures

The Knoxville City Schools assigned Alice Bell and Belle Morris Schools for the study. Graduate students from the Psychology Department of the University of Tennessee first administered the Peabody Picture Vocabulary Test Form A to over 200 children entering first grade in those two schools. Those children who tested retarded were not further tested. Those remaining were tested on the Walking Board Motor Ability Test as defined by Kephart (18), Winter Haven Form Copying, Visuals I and Ocular Motility (see Appendix I). The children did the Winter Haven and Visuals I in groups of five pupils at a time, the other tasks individually.

Two treatment groups of seven children each were matched for Peabody I.Q., Winter Haven scores, age, and sex at Alice Bell. Treatment Group One participated in daily 20-minute visual-motor-perceptual training without using the reading activities until late March, when the matching Group Two joined them for the second phase--reading activities. Each group contained a cross-section of intelligence scores and other matching criteria. Group Two had no experimental treatment until combined with Treatment Group One for five weeks of reading teaching.

When the children for treatment were first selected at the beginning of the year, the school had just two first grades for 66 children. However, after the treatment was well under way, a third teacher was hired and the slow learners, as identified by the other two classroom teachers, were assigned to the third teacher. This left three classes of about 22 each, with the concentration of slower children in the third class. It was a much-improved arrangement for the children's learning, but the abnormally small classes undoubtedly affected the results of the experimental treatment.

A male graduate student in Psychology was responsible for the visual-motor-perceptual program with the children and for the first two weeks of the reading program. The investigators instructed him and supervised his work with the children. The investigator, who had been with the student and children two sessions weekly in supervision, completed the remaining three weeks with the children in Phase Two. (See Appendix II for the curriculum outline for the treatment groups.)

In March, before beginning Phase Two, group testing was carried out with all of the first grade classes at Alice Bell School on the Winter Haven Form Copying, Visuals II, a word recognition test constructed from their reading vocabulary list, Gates Primary Word Recognition Test Form 1, and the California Lower Primary Reading Tests and Letter Matching Form W. Those data were to compare gains of Groups One and Two and classes through March and from the beginning of the reading phase of the experiment with the combined group to the end of the year.

In May the Winter Haven Form Copying Test, Visuals III--1966, Gates Primary Word Recognition Form 2 and California Lower Primary Reading Test and Letter Matching Form X were again administered to all of the subjects in both schools.

Results

The analysis of the data attempted, first, to discover the variable which was the best predictor of reading disability and, second, to determine if a number of variables might enhance the predictive value significantly. In attempting to predict and remediate the investigated disability, the investigators sought to use methods which school systems could use with their present personnel with little cost or time involved. No attempt was made to use variables other than the I.Q. testing that would include other than the visual-motor-perceptual tasks. The sample was truncated by excluding all I.Q.'s in the retarded range as measured by the Peabody Picture Vocabulary Test. Therefore, as the data is presented and correlations compared, it is necessary to remember the somewhat critical type of sample. From other studies one would expect the correlation to increase as the number of subjects of lower I.Q.'s were utilized.

Table I will identify the variables and reveal that even though Winter Haven held first predictive rank with the California Letter Recognition Test, the Letter Recognition Test showed too small a distribution of scores (task too easy) to be of real usefulness with such a sample. The Walkboard error also showed too little deviation from the mean to yield discriminating scores. The mean entrance age was 6-2 years.

Table II, Correlation of Single Variables[1], shows the highest single correlation was the Gates with the California reading tests.

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[1]BMD02D Correlation with Transgeneration - Version of March 28, 1964, Health Sciences Computing Facility, UCLA was used.

Table I

MEANS AND STANDARD DEVIATION

Variable	Mean	Standard Deviation
1. Sex, 1 M, 2 F	1.48	0.50
2. Age (Months)	74.65	4.22
3. Winter Haven 1965	24.10	11.40
4. Winter Haven 1966	31.44	9.71
5. Visuals I 1965	18.66	8.95
6. Visuals III 1966	20.73	7.17
7. Composite Gates and California	181.20	14.98
8. California Reading LP	87.85	7.79
9. California Reading LP Letter	22.86	1.91
10. Peabody I.Q.	99.93	13.26
11. Ocular Motility Error	11.33	8.90
12. Ocular Motility Time (Seconds)	76.18	16.90
13. Walkboard Time (Seconds)	81.83	25.77
14. Walkboard Error	2.01	2.31

Table II
CORREIATION OF SINGLE VARIABLES

	Variable 1 Sex	Variable 2 Age	Variable 3 WH 65	Variable 4 WH 66	Variable 5 Vis 65	Variable 6 Vis 66	Variable 7 Gates
1.	1.0000	0.0224	-0.0723	0.0322	0.0106	-0.0010	0.1248
2.	0.0224	1.0000	0.3355	0.1095	0.3047	0.2147	0.0530
3.	-0.0723	0.3355	1.0000	0.4720	0.5381	0.4461	0.4495
4.	0.0322	0.1095	0.4720	1.0000	0.3708	0.3940	0.3392
5.	0.0106	0.3047	0.5381	0.3708	1.0000	0.4430	0.2797
6.	-0.0010	0.2147	0.4461	0.3940	0.4430	1.0000	0.3605
7.	0.1248	0.0530	0.4495	0.3392	0.2797	0.3605	1.0000
8.	0.1723	0.0543	0.4173	0.3486	0.2544	0.3129	0.8464
9.	0.0027	0.0702	0.3220	0.2929	0.2593	0.2629	0.4149
10.	0.0112	-0.1919	0.2607	0.2853	0.1815	0.2656	0.3684
11.	-0.0895	-0.2291	-0.2544	-0.1429	-0.1161	-0.1592	-0.0942
12.	-0.1400	-0.2112	-0.1666	-0.1179	-0.0543	-0.1019	-0.0630
13.	0.0679	-0.1118	-0.0874	-0.1479	-0.0257	-0.1481	0.1286
14.	-0.1185	-0.2089	-0.2183	-0.1951	-0.2082	-0.1878	-0.0857

	Variable 8 Calif.	Variable 9 Calif. LR	Variable 10 I.Q.	Variable 11 Oc.Mot.Errors	Variable 12 Oc.Mot. Time	Variable 13 Walkboard Time	Variable 14 Walkboard Errors
1.	0.1723	0.0027	0.0112	-0.0895	-0.1400	0.0679	-0.1185
2.	0.0543	0.0702	-0.1919	-0.2291	-0.2112	-0.1118	-0.2089
3.	0.4173	0.3220	0.2607	-0.2544	-0.1666	-0.0874	-0.2183
4.	0.3486	0.2929	0.2853	-0.1429	-0.1179	-0.1479	-0.1951
5.	0.2544	0.2593	0.1815	-0.1161	-0.0543	-0.0257	-0.2082
6.	0.3129	0.2629	0.2656	-0.1592	-0.1019	-0.1481	-0.1878
7.	0.8464	0.4149	0.3684	-0.0942	-0.0630	0.1286	-0.0857
8.	1.0000	0.3850	0.3182	-0.0537	-0.0038	0.1785	-0.0889
9.	0.3850	1.0000	0.2527	-0.1398	-0.1045	-0.0938	-0.1073
10.	0.3182	0.2527	1.0000	-0.1046	-0.0625	0.0706	-0.0503
11.	-0.0537	-0.1398	-0.1046	1.0000	0.8431	0.1863	0.3494
12.	-0.0038	-0.1045	-0.0625	0.8431	1.0000	0.1353	0.3970
13.	0.1785	-0.0938	0.0706	0.1863	0.1353	1.0000	0.2885
14.	-0.0889	-0.1073	-0.0503	0.3494	0.3970	0.2885	1.0000

The next was the Visual 1965 with the Winter Haven 1965. The highest single correlation of the preliminary testing with the reading tasks was the Winter Haven Form Copying Test with the Gates Primary Word Recognition Test, a correlation of .4496; and when Gates and California combined, a slightly higher .4511 was observed. (See Table III for the correlations with the composite reading score.)

A correlation of .3684 was seen between I.Q. and the Gates Primary Word Recognition and .3182 with the California. But I.Q. dropped to a correlation of .2527 on letter recognition.

Third place as a predictor were the Visuals of 1965 with a correlation of .2797 with Gates, .2544 with California. Visuals 1965 rose to second rank to correlate with letter recognition at .2593.

The Visuals 1966 administered in May showed a higher correlation with reading than the similar test used as the predictor. This could be attributed to the classroom training which would be reflected in the child's ability to improve in the performance of such tasks. However, the correlation on the form copying test would elicit the same expectation, but it showed a drop in correlation. The initiator wonders if both the method of administration and the items, particularly the last three on Visuals III 1966, would be better used as a predictor than Visuals I 1965. (See Appendix I for test materials and administration.)

Testing the hypothesis that the bottom quartile on the pretesting would cluster in the bottom one-third of the sample on the reading achievement distribution shows on the scattergrams from the computer sheets that of the bottom 48 scores on the Winter Haven, 32 (67%) fell in the lowest 65 scores on reading on the Gates criterion. Twenty-nine percent were above the class median and 71 percent below the median on the achievement.

Examination of the top one-fourth of the sample scores on the Winter Haven reveals 14 percent in the lowest one-third in reading and 73 percent above the mean score.

Exploring the distribution of the Winter Haven with the California Lower Primary Reading Test shows 63 percent of the bottom 48 children on the pretest in the bottom one-third on the post test. Thirteen percent of the lowest 48 were in the top one-third on the California.

Of the top 45 children on the Winter Haven, 13 percent were in the bottom 61 children, and 67 percent were in the top one-third of the sample.

Table III

CORRELATION OF COMPOSITE READING SCORES
AGAINST EACH OF THE OTHER VARIABLES

	7
1.	0.1546
2.	0.0558
3.	0.4511
4.	0.3579
5.	0.2780
6.	0.3504
7.	1.000
8.	0.9607
9.	0.4163
10.	0.3573
11.	-0.0770
12.	-0.0348
13.	0.1598
14.	-0.0909

Though clustering occurs, the predictor by itself would be insufficient. Linked with other tests of different abilities not included in the Winter Haven, but necessary for reading, the correlation could, perhaps, be raised to be of some validity. Or further testing of extremes might prove a more economical procedure for identifying exceptional children and for grouping and remediation of early disability.

Further examination of comparisons with other studies reveals that the highest predictor in this sample generally equals or surpasses the predictive value of group I.Q. tests such as Lorge Thorndike. The I.Q. tests appear to be of little value in prediction by themselves and generally of small value when added to other predictors.

Information from multiple correlations showed little improvement over the predictive value of the Winter Haven by itself. The Winter Haven as the best single predictor with the composite scores of Gates and California showed correlation of .4511 raised to .5149 with the addition of I.Q.; to .5173 with the addition of I.Q. and Ocular Motility; and to .5180 with the addition of the Visuals 1965 to those.

Table IV

MULTIPLE CORRELATION WITH COMPOSITE READING SCORE
GAIN IN EFFICIENCY IN PREDICTING READING ACHIEVEMENT

Variables	Multiple R
Winter Haven	.4511
Winter Haven, I.Q.	.5149
Winter Haven, I.Q., Ocular Error	.5173
Winter Haven, I.Q., Ocular Error, Visuals 1965	.5180

Treatment Groups

The t test revealed no significant differences in the matching criteria of the two treatment groups. The measures of learning improvement from March to May were compared for each group. No significant difference appeared in the Gates measure. With the hypothesis that there would be no difference also on the California, a two-tail test revealed the t score significant at the .05 level. The mean score of improvement for the treatment group was 14.71 and 8.29 for the controls.

One could hardly conclude that such treatment would necessarily be appropriate for any first-grade classroom or

produce reliable results. But it does bear further investigation, particularly in view of the fact that usually those in the control group were having reading activities in the regular classroom while the treatment group was having the less direct visual-motor-perceptual training.

Summary and Conclusions

This study examined the relationships between pre-reading measures of visual-motor-perceptual skills and the reading achievement at the end of first grade. For the predictive study 14 variables were included. Five pretests were used as possible predictors. Gates Primary Word Recognition Test and California Lower Primary Reading Tests were given at the end of the school year as criteria. Complete data were gathered on 188 pupils, but 14 were drawn out for experimental purposes, leaving a sample of 172 pupils.

The Winter Haven Form Copying Test showed a correlation of .4511 with the composite reading score. Multiple correlation of the other variables failed to show significance.

The experiment to discover any significant difference in learning improvement from March to May because of visual-motor-perceptual training reached significance at the .05 level.

Educational Implications

Surveying the relationship between coordination tasks and first grade reading achievement by a pre- and post-test procedure leads to many different conclusions depending on the population studied and the specific validity of the tests employed. Investigators using similar techniques report very different results ranging from substantial correlation relationships to no relationships at all. Few tools seem to be sophisticated enough to pick out organic defects in a child's perceptual functioning unless such defects are "grossly obvious." Furthermore, from past studies, as well as in this one, age seems to be more significantly linked with the visual neurological skills than with the reading disability. Studies which have attempted to assess the relation of visual-motor-perceptual abilities as predictors of reading achievement in the first year have generally reported small positive correlational relationships ranging from .10 to .40. Likewise, studies using other modalities singly or in combination have failed to show high enough correlation to be trusted for prediction.

The conclusions from this investigation are broader than just the testing of the hypothesis and identifying the predictors

of the reading achievement. The data warrant further study. The Winter Haven Form Copying was the best predictor for reading achievement. The next best predictor was the I.Q., but it failed to add significantly to the Winter Haven. Interestingly, the lowest correlation was age with reading, even though that is the criterion used for beginning reading and the age for entrance has been raised in Tennessee. Other studies appear to redound with similar age findings. Hence the need to find better criteria.

The findings contributed additional evidence to the usual conclusion that learning to read is an extremely complex and elusive task. Linked with another predictor that would embrace measurement of other skills necessary to reading but not contained within itself, the Winter Haven could become useful in prediction and diagnosis of early reading achievement. At least it shows as high correlation as most studies of predictioh have been able to identify otherwise with one single screening procedure. Predictors used ought not to require administering a battery of readiness measures that would be difficult or expensive for the public schools. Predictors before entering public first grades are still needed, especially in areas where public kindergarten does not prevail. It isn't just the furnishing of the data to the first grade teacher that would be useful, but rather the usefulness in grouping children in classes where they could be appropriately taught and assured of success. One link with Winter Haven that might be useful in identifying the neurologically impaired child would be better question forms used by the medical doctors and nurses examining the children during the pre-school round-ups. Questions concerning pre- and paranatal abnormalities might help pinpoint the child with potential learning difficulties. Better evaluation of the presently used Snellen examinations could elicit more refined prediction.

Likely the Peabody Picture Vocabulary Test shows an even lower than usual I.Q. correlation with reading because it does not include many of the visual-motor tasks necessary in reading.

Whether better methods of scoring and scaling the other predictors believed contained in the prime predictor would facilitate or simplify the process or prediction is questionable. While the tests seem to be of real use diagnostically within a clinical setting after the disability has become apparent, they seem to be of little value at present as predictors. It might be of some value to classroom methods to discover differences on the visual-motor tasks with reading after the year of reading teaching. Do the low reading achievers fail to develop in the visual task as do those in the normal population? Are such difficulties related in a more significant way to school grading than to reading achievement? Does the disability found clinically

tend to be cause or result of the academic achievement level?

Examination of distribution of scores in the eight different classrooms showed three classes significantly superior in reading performance to the other groups. The class with the lowest mean I.Q., 93.15, was the third highest in mean California reading achievement. And yet a rho test by groups showed correlation there of .69. And in the experimental and control groups why did the children relegated to the "slow learner class" equal or excel the learning improvement rate when compared with the other two classrooms from which they came?

Could another missing part of the correlation be the need to measure the teacher in her effectiveness? Still another link with learning to read by public school methods would be auditory skill. The investigators might suggest the use of the Harrison-Stroud Reading Readiness Profiles of 1956 with the Winter Haven. Again, other studies combining the two sensory and neurological areas through group testing defy correlation high enough for prediction. What does the master teacher do to bring all of the child's learning capacity to successful fruition? Is is that, like with Montessori (24), the child with inferior organic equipment, given the gifted teacher, can still equal or outstrip those with high potential?

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*Used for the experiment part of the study, either for help in instructing the experimenter or as a part of the curriculum.

APPENDIX I

TESTING MATERIALS AND

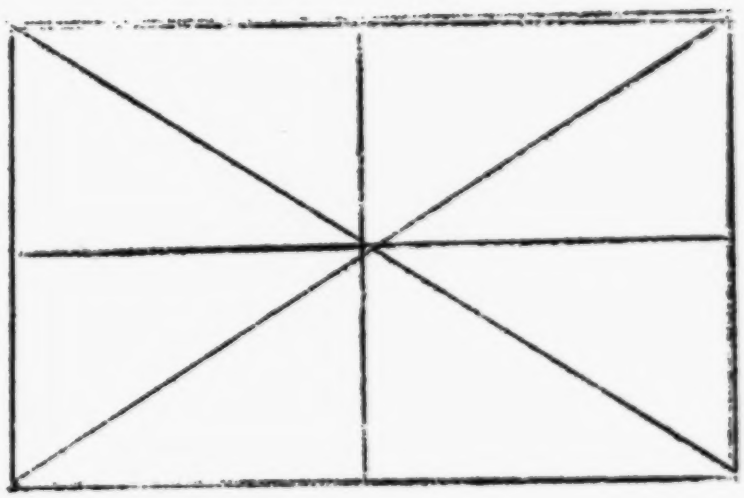
SCORING METHODS

TABLE V

SUMMARY OF INFORMATION ON MEASURING INSTRUMENTS

Variable No.		Name of Test	Test Battery	Ability Tested
10	X	Peabody Picture Vocab.	Form A Class Group 1965	I.Q.
3	X	Winter Haven Form Copying		Eye-Hand coordination Form perception and Copy ability
5	X	Visuals	Murray 1965	Reproducing from Visual recall
11	X	Ocular Motility Error	Murray 1965	Ability to visually track a moving target with speed and accuracy
12	X	Ocular Motility Time		
13	X	Walkboard Time	Kephart Scale	Spatial orientation and body balance
14	X	Walkboard Error		
6	-	Visuals	Murray 1966	Reproducing from visual recall, reliability test
4	-	Winter Haven Form Copying	Class Group 1966	Eye-Hand coordination Form perception and Copy ability Test reliability
7	Y	Gates Primary Word Recognition	Form 2 (Both schools) May 1966	Word recognition
-	Y	Gates Primary Word Recognition	Form 1 (Alice Bell only March 1966)	Word recognition
8	Y	California Reading	Lower Primary X (Both schools, May 1966)	Word recognition, Paragraph meaning Following written directions and Letter recognition
9	Y	California Reading	"	Same as Form X
-	Y	California Reading and Letter Recognition	Lower Primary W (Alice Bell only March 1966)	

WINTER HAVEN FORMS

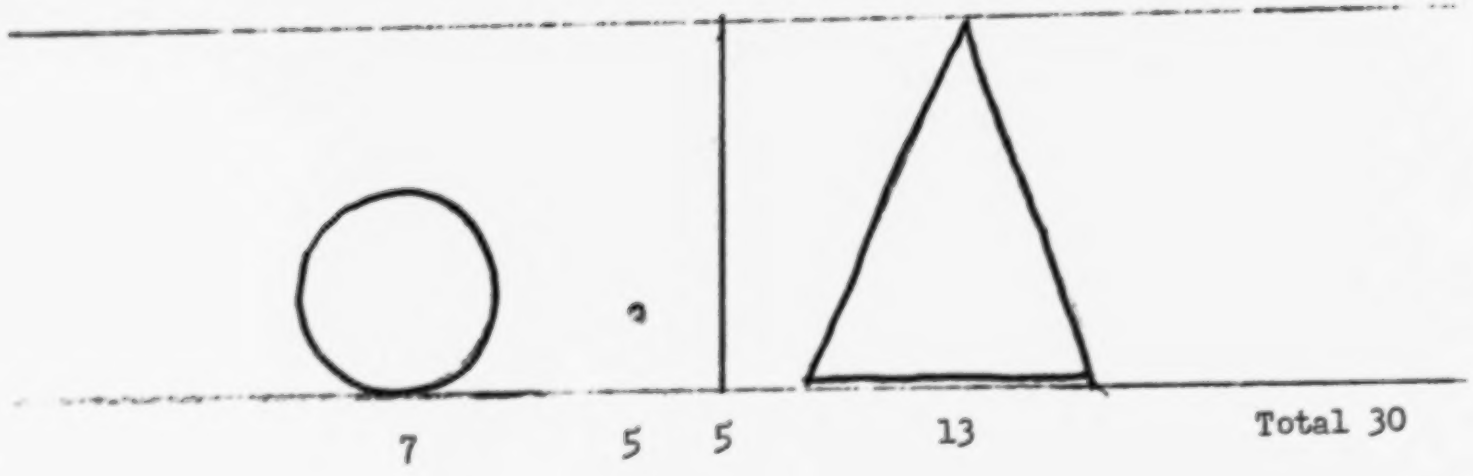


Visual Achievement Forms, Teachers Edition. Eyesight Conservation Committee, Winter Haven Lions Club, Winter Haven, Forida, 1956.

Follow manual for administration and scoring.

VISUALS I
September 1965

NAME



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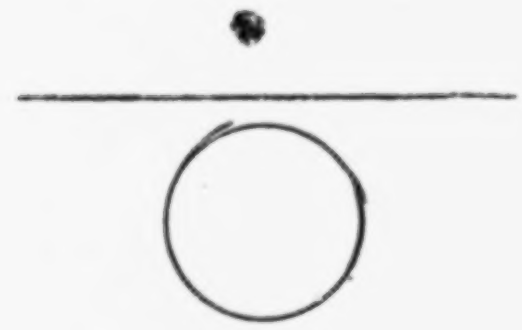


2
5 Total 9
2

Total 39

Scoring as marked 39
Additional points as follows:
Size relationship 5
Left to right 5
Top to bottom 10
Lining and 7 } 10
Placement 3 }
Total 69

VISUALS I
September 1965
Instructions for Administration

Either have the Visuals sheets with the names already on them to pass out to the children, or take a few minutes to help them put their names on their papers on the proper line. If you ask them to put their name in the space you show them, many will be able to do so, many will not. Take the few minutes to go through the group to help with names if this seems a quicker way.

Item I

I am going to make a row of patterns. Then I will take them away and ask you to make them just as I did. Watch and listen carefully. I am making a circle that sits on the line.

Now a little solid circle goes beside it, but it can't sit on the line as the first circle can.

Now I'm going to make a tall line to touch this top line and this bottom line.

Now I'm making a triangle that sits on the line and touches its point on this line.

(Remove the model immediately.)

Now you make the patterns just as you remember I made them.

Fold your paper this way so this dotted line is on the outside. (Make sure each child has the clean bottom half of his paper and that his paper is in proper position for the next pattern.)

Item II

I will ask you to draw this pattern for me just as I have drawn it. Wait until I finish. Then you may begin.

I am drawing a nice long line this way.

Now I am putting a little round dot above the line.

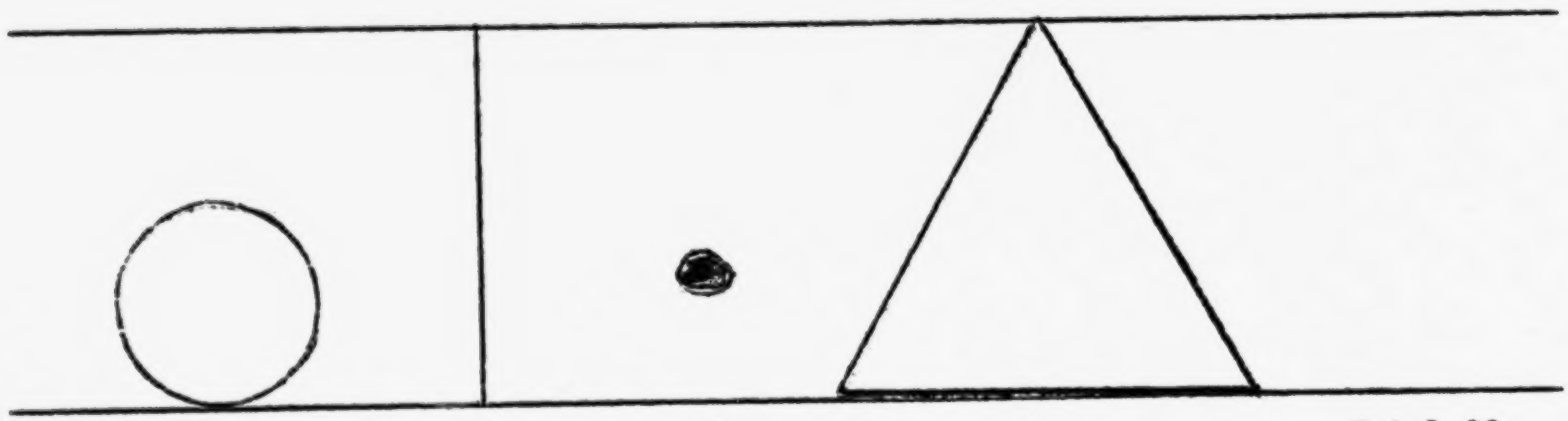
Now I am drawing a small round circle under the line.

(Remove the pattern and allow the children to draw the pattern from memory.)

Collect the papers quickly from the children and put the papers in folders marked by school, classroom and date and test.

VISUALS II
Alice Bell School
March 1966

NAME



7 5 5 13 Total 30

(Fold) - - -

VISUALS II
Instructions for Administration

"Find this place where it says Name on your paper. Put your finger there." (Check to make sure each child has the right place.) "Now print your first and last names on that same line."

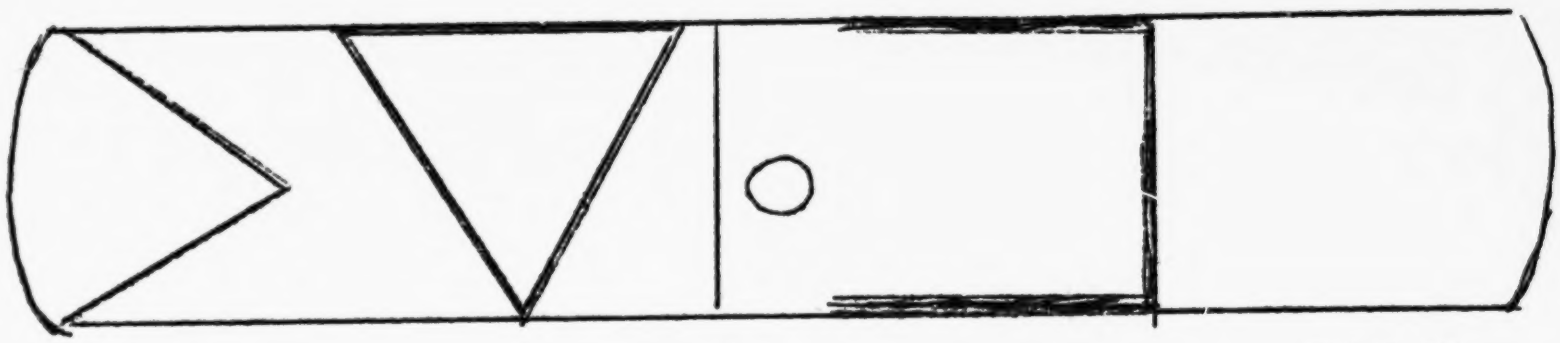
"Now put your finger here between these two lines on your paper. I am going to show you some patterns for you to draw between these two lines on your paper. Take a good look at my copy so you can remember where to put each figure and so you can remember the size to make each. Leave your pencil in the desk pencil holder until I take away the pattern and tell you to begin." (Hold the pattern with a cover card so that all can see well.) "Ready? Look." Remove the cover card without moving the pattern and expose the pattern row for five seconds.

Now fold your paper this way so this dotted line is on the outside. "Good. That's the way." (Make sure each child has the clean bottom half of his paper, and that his paper is in proper position for the next pattern.) "Now I am going to show you a pattern I want you to draw from memory." (Hold up the pattern with a cover card. Be sure pencils are down.) "Look and remember." (Expose by removing the cover card for two seconds. It will likely be unnecessary to tell them to draw the pattern. If a child fails to begin, give him quiet instructions to begin.)

Thank the children and collect the papers quickly. Put them in folders marked by school, class, date and test.

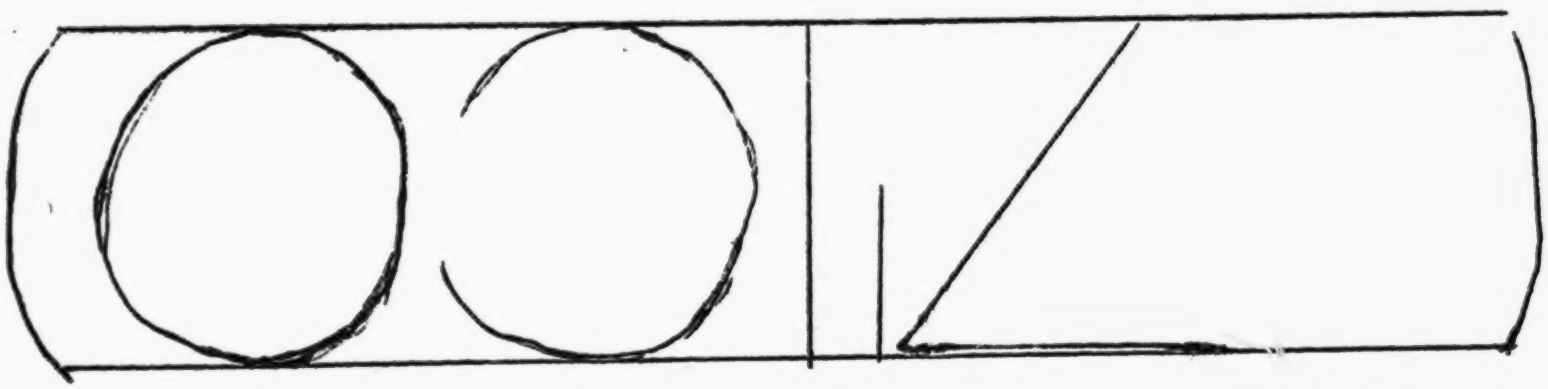
VISUALS III
May 1966

A



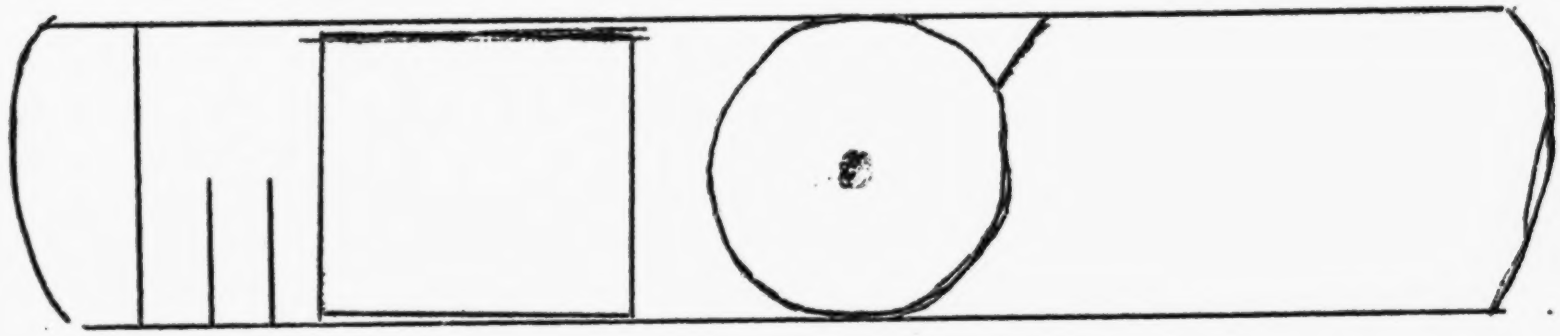
2 2 2 2 2 Total 10

B



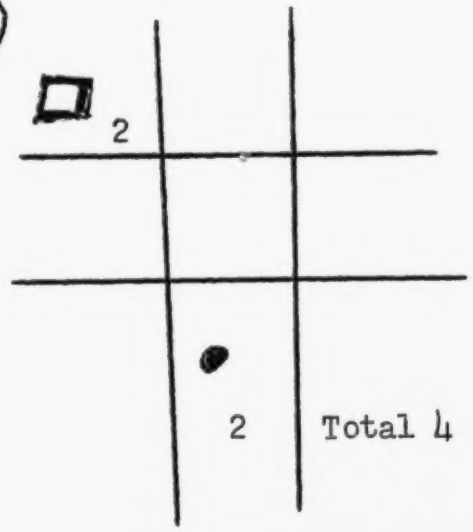
2 2 2 2 2 Total 10

C



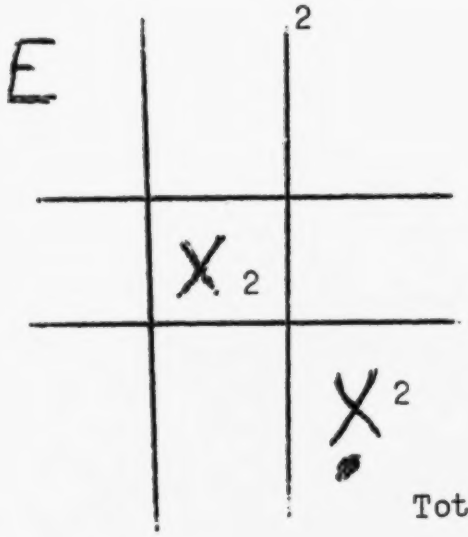
2 2 2 2 Total 10

D



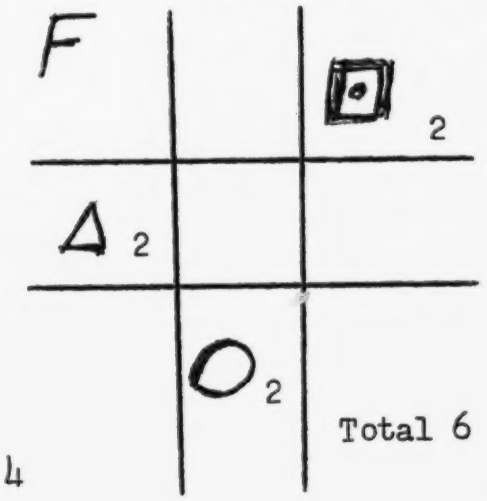
2 2 2 Total 4

E



2 2 2 Total 4

F



2 2 2 Total 6

NAME

VISUALS III (RECALL)

"On the paper you have just been given, find the place at the bottom where it says name. Put your first and last names there at the bottom."

(The children are to put their pencils down between each figure, leaving them down until the examiner says, "Begin." The visuals are not copy work, but are visual recall.)

To the children: "Find the lines drawn together marked A. (Point to space between lines.) You will use these lines marked A to put your drawing in. I will show you a line of figures (on class size tagboard, one pattern only on each board, cover card to remove for exposure) that I will want you to make from memory. You are to leave your pencils on the pencil holder (slot) until I say for you to begin. When I tell you to begin, you are to make the line of figures within the lines marked A. Do the best you can to remember them as you saw them on my pattern sheet." (Examiner exposes the A pattern seven seconds.) "Begin." After time for the children's printing, say, "Put your pencils down."

To the children: "Find the lines drawn together marked B. You will use these lines marked B to put your drawing in. I will show you a line of figures that I will want you to make from memory. You are to leave your pencils on the pencil holder until I say for you to begin. When I tell you to begin, you are to make the line of figures within the lines marked B." (Point to space B). "Make the line of figures just as you remember them from the pattern sheet I am going to show you." (Examiner exposes the B pattern seven seconds. Be sure the children can all see from the very first second.) "Begin." After time for the children's printing, say, "Put your pencils down."

To the children: "Now find the lines drawn together marked C. (Point to the space.) You will use these lines marked C to put your drawing in. I will show you a line of figures for you to make from memory. When I tell you to begin, you are to make the line of figures within the lines marked C. Make the line of figures just as you remember them from the pattern sheet I am going to show you." (Examiner exposes the C pattern seven seconds.) "Begin."

To the children: "Find the lines marked D. (Point to the proper place.) "I am going to show you a pattern for you to remember so you can make the same pattern on your paper." (Examiner exposes the D pattern two seconds. Be sure that the pattern is elevated before exposure so that all pupils can see it at once.) "Begin." After sufficient time for the reproduction, say, "Put your pencils down."

To the children: "Find the lines marked E." (Point to the proper place.) "I am going to show you a pattern for you to remember so you can make the same pattern on your paper." (Examiner exposes the E pattern two seconds. Be sure that the pattern is elevated before exposure so that all pupils can see it at once.) "Begin." (After sufficient time for the reproduction, say, "Put your pencils down.")

To the children: "Find the lines marked F." (Point to place on paper.) "I am going to show you a pattern for you to remember and make on your paper." (Examiner exposes the F pattern two seconds.) "Begin." (After sufficient time for the reproduction, say, "Put your pencils down.")

Collect papers. Put them in a folder by school, classroom, date and test.

SCORING VISUALS III

A through F, May of 1966

For each individual figure a credit of two points is to be given. If the figure is adequately made for a child in the last of first grade, full score may be given. Deduct one for any figure not having the proper sequence, proportion or placement. If the figure is inverted, or otherwise turned incorrectly, though the gross form and sequence are correct, deduct one point. A perfect score would be 44 points. Scctions A,B and C each have a total possible score of 10. Figures D and E each have a total possible score of 4, and F has a possible score of 6.

OCULAR MOTILITY TESTING

During the actual target tracking the child must hold his head completely still so that the tracking is done entirely with the eyes without head-movement compensation.

For a target use a small colored-paper airplane stuck in a pencil eraser with a thumbtack. Make sure the child faces you in a completely parallel fashion so that his eyes will be equidistant from the target. You will be seated just within your arm's length of the child. Holding the target about 16 or 18 inches in front of the child's nose, explain, "You are to follow this airplane with your eyes wherever it goes. Do not take your eyes off the plane. It will move around and around, up and down, back and forth, and in and out." Make sure the child finds the tack on the airplane with his eyes. If necessary, take his hand to direct his eyes to find the target. The examiner is to take the target in patterns that will be within the child's shoulder width, the top of his head and midway of the chest. If necessary, the examiner is to partially repeat the beginning of each change of movement--without breaking the eye movement--saying such as, "Now around and around the other way." "Now follow all the way out again." Take especial care on the convergence that the child can and does track outward in focus as well as inward. Notation must be made if either eye fails to turn with the other eye to maintain binocular vision. The patterns to be made are: three counterclockwise circles, three clockwise circles, three oblique left lines, three oblique right lines, three vertical up and downs, three horizontal back and forths, and three ins and outs.

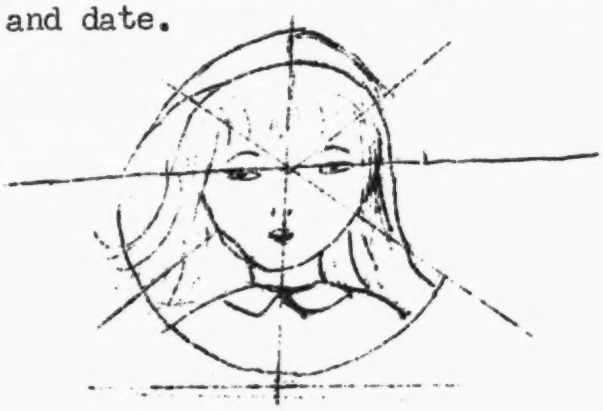
Errors are deviations from the target. The child's eyes may momentarily lose the target by over-shooting, under-shooting, looking beyond, or fixating the gaze upon the examiner or extraneous materials and distractions. Even a momentary jerk or bump in which the eyes fail to track smoothly is an error. Eyes are to track three times in each direction perfectly smoothly and rhythmically with fair speed for a perfedt score. The child with completely adequate visual development will track in such a fashion that it will appear that you are moving his eyes with strings attached to the target.

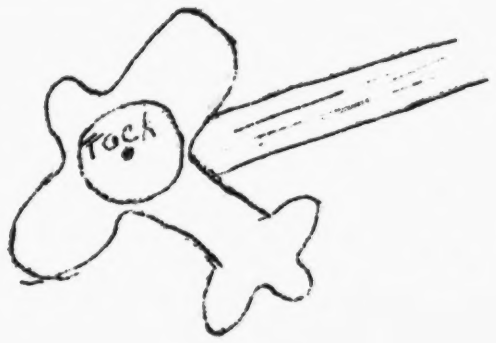
Watch for fatigue symptoms. Some of these might be an appearance of eye redness, beginning tearing, tension, relief at the close, or choosing alternative activity. Make notation of such symptoms. They further identify likely learning disability.

Count the cumulative errors for all patterns. Record this number.

Timing should start simultaneously with the beginning of the first pattern and stop immediately at the close of the last pattern. Record this time in minutes and seconds on the score sheet. Most adequately developed children can complete the tracking in slightly over one minute.

Put each child's score sheet in the folder marked for the test, school, class, and date.





School: Name:

OCULAR MOTILITY SCORING

	Trials	Speed
1. Circular (Ex's) left: (Counterclockwise)	1 2 3	_____
Errors:	_____	
2. Circular (Ex's) right: (Clockwise)	1 2 3	_____
Errors:	_____	
3. Oblique left: (Up and Down at 45 degree angle)	1 2 3	_____
Errors:	_____	
4. Oblique right: (Up and Down at 45 degree angle)	1 2 3	_____
Errors:	_____	
5. Vertical (Up and Down)	1 2 3	_____
Errors:	_____	
6. Horizontal (Back and Forth)	1 2 3	_____
Errors:	_____	
7. Convergence (In and Out)	1 2 3	_____
Errors:	_____	

OTHER SYMPTOMS:

Esophoria (eye turns in, losing focus) Left Right

Exophoria (eye turns out, losing focus) Left Right

Which eye suppressed? No. Errors? Left Right

Deviation at center line? Left Right Both

Lack of fluidity

Tearing

Tension

Redness

Strabismus, transitory or otherwise

Eye rubbing blinking eye stretching yawning other?

Note if the eye movement is erratic and yet blooming and grasping of the visual stimulus occurs. This sometimes happens with a child of extremely fluent visual motility.

Name:

WALKBOARD SCORING FORM

		Time	Errors	Score
(2) Front:	Over			
	Back			
		Time	Errors	Score
(3) Backwards: (one way)				
		Time	Errors	Score
(1) Sideways:	Over			
	Back			

Follow Kephart instructions and scoring scale.

File each child's score sheet in the folder marked by test, school, class and date.

APPENDIX II

OUTLINE AND SEQUENCE

OF THE TRAINING SESSIONS

TRAINING ACTIVITIES

Phase I

Since the children would be on the floor for several weeks, they were first taught how to get into their coveralls quickly as soon as they entered the room.

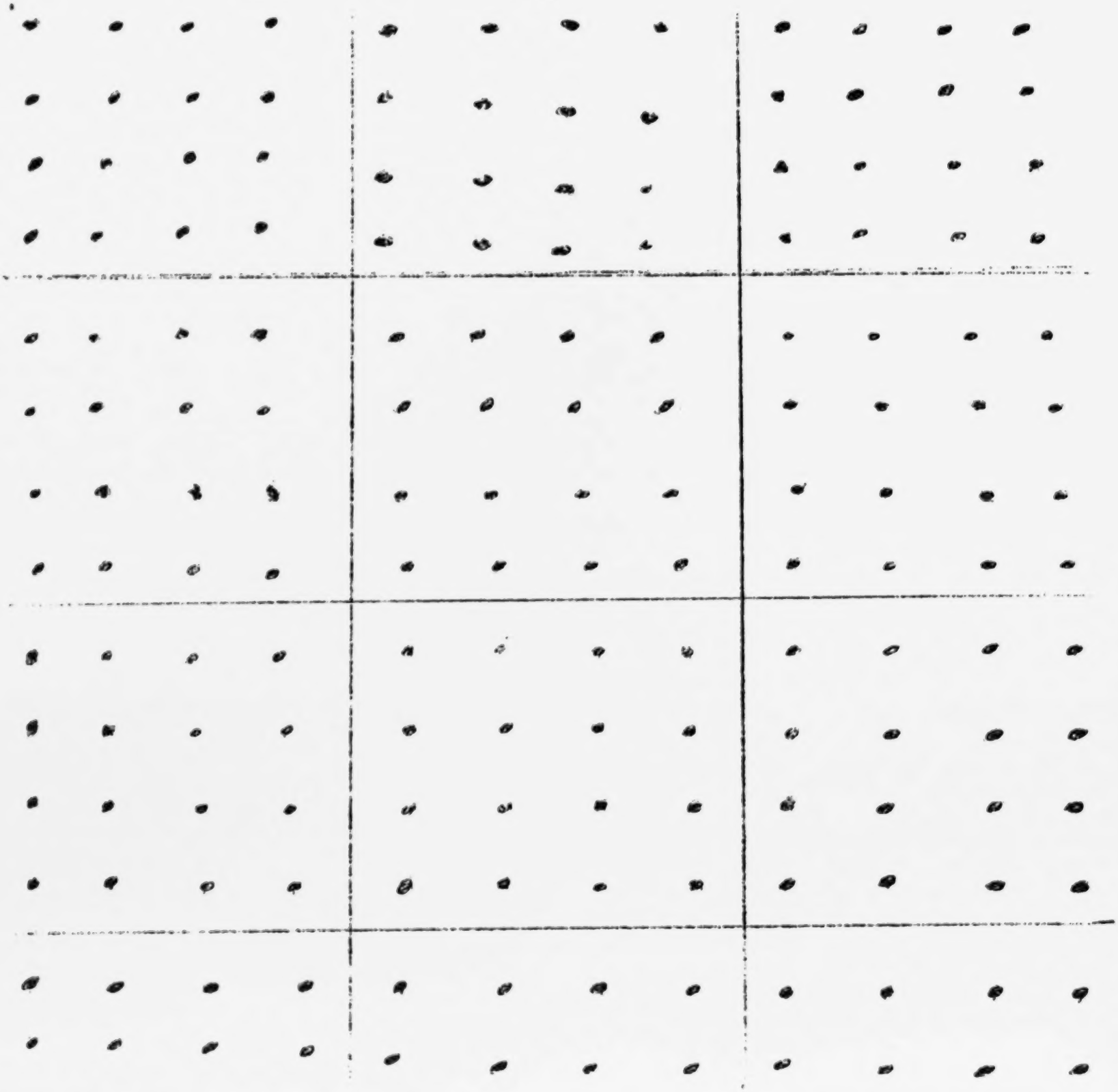
1. Sighting from back position
2. head turns from prone position to sight targets
3. Tracking light beam across ceiling
4. Pointing target, sighting only with dominant hand and eye
5. Arm waving, alternating sides, bilateral, and one side only
6. Arms and legs in air in the same sequences, addition of rhythm
7. Head raising, head raising with sighting
8. Body roll, shoulder propulsion
9. Body roll, leg propulsion
10. Body pull with arms crossed, dragging the torso to the target point, both arms at once, then alternating arms
11. Hands and knees, hands to go on floor markers
12. Crawling with pelvis raised and knees straight (monkey walk). Targets for hand placement
13. Visual coordination with body parts
14. Visual coordination with body parts and room targets
15. Kneeling
16. Grasping from kneeling position
17. Body pull to upright positions
18. Body pull and grasping with upright positions
19. Windmills, prone
20. Windmills, upright
21. Head and Shoulders
22. Sitting position without aid of arm support
23. Indian sitting and rising
24. Sitting positions with knees straight, bent, crossed
25. Hopping on right foot to goal
26. Indian squat with arms folded
27. Ball rolling with both hands, then right hand only
28. Windmills, adding rhythm
29. Head and shoulders
30. Head and shoulders and knees
31. Head and shoulders, knees and toes, adding rhythm when it could be attained
32. Prior item using right hand only
33. Rising on arms with elbows straight from stomach position
34. From standing position alternate bringing feet up with knee to waist
35. Leg cross
36. Parallel foot movement, adding doing the movement on a line, rhythm
37. Jumping, jumping within marked spaces, both feet parallel, varied distances and angles
38. Jumping with right foot (All the children were right handed.)
39. Hopping
40. Simplified hopscotch, increasing difficulty to full game
41. Hopping on a line with right foot
42. Ball passing, decreasing size of ball and increasing distances, bilateral and then right hand only

43. Pitching balls of various sizes into boxes of various sizes and distances
44. Keeping balloons aloft, both hands, then just right hand
45. Balloon kicking toward goal, using right foot only
46. Obstacle course of bowling, catcho, hopscotch, ball pitching, dart gun, balloon tracking, marsden ball, tape hopping
47. Walkboard and Getman manual items
48. Dodge ball with plastic net ball
49. Walkboard items from Getman manual (pp. 31-39)
50. Chalkboard items begun (pp. 45-46)
51. Pegboard
52. Templates, chalkboard
53. Finger jumps and ocular pursuit
54. Large templates at desks
55. Freehand reproduction of forms
56. Combined forms with large templates at board and at desk
57. Walkboard continues through many sessions for short review periods
58. Additional template patterns
59. Cutting out patterns that have been made
60. Pasting cut-outs on paper patterns
61. Dot charts, two kinds, varying procedures in developmental difficulty
62. Draw and color desk template forms
63. Desk templates on colored paper, cut and pasted on paper with template patterns
64. Review of many of the items previously practiced
65. Review of proper throwing positions to achieve laterality (and coordination), duckwalk
66. Climbing steps, balancing on toes
67. Matching series of geometric forms on the pupil charts from master card copy, for placement on the chart, from master filmstrip, then from visual recall from filmstrip flash
68. Matching placement of materials, copy and later visual recall
69. Remembering forms flashed with card tachistoscope
70. Remember different types of forms and placements
71. Dot charts, sometimes used also with the pegboards

Phase II

1. Response cards to reproduce master copy of short words, then reproduction from recall
2. Reading with letter names(long vowel sounds), discovery from list of words differences of long and short vowels
3. Short vowels, closed syllables, one vowel a day. Short vowel families
4. Initial and ending substitution in short vowel families. Class and small group games
5. "My Magic Words" filmstrip and record
6. Lippincott Pre-primer basic reading filmstrip and follow-up from Webster Company short vowel materials
7. Words that name and words that do (sorting sight words from the list on the board linguistically)
8. Manipulative devices made by the children for beginning and ending substitutions and for short vowel substitution
9. Identifying short vowel sounds orally
10. Sounding and spelling with short vowels. Progression from known word to spell other words

11. Continued brief presentation of Webster reading materials reproduced on acetate with overhead projector
12. Further eye training with overhead projector.
13. Sentence arrangement with cards, and with overhead projector
14. Visual recall of forms other than usual reading forms
15. Visual recall of forms used in reading (card tachistoscope)
16. Reproduction of spelling sequence with magnetic chalkboard (highly successful for subgroup training)
17. Reproduction and recall of spelling using the letter cards and response cards (also very versatile in use and highly motivating to all the children)



These dot sheets were used with the first column for copying step-by-step from the master copy the experimenter was teaching from. The middle column was used for direct copy, and the last column was used to try to reproduce the pattern from memory. Sometimes the first step-by-step procedure was omitted and each child was given the sheet with the copy pattern already made for him on the first column. He was to reproduce the pattern by copying on the second column. He used a cover card then and reproduced the pattern from memory in the third column. This procedure, along with the three-dimensional pegboard, proved difficult for most, but was highly rewarding in motivation and measurable progress in visual examination skills. Oblique lines were rather consistently more difficult.

These dot sheets were used in various ways--for step-by-step copying, for straight copy, for visual recall and for copying from three-dimensional pegboard. Larger forms and interlocking forms were used on this sheet.

Word Game

Sound Game

1	2	3
4	5	6
7	8	9
10	11	12
13	14	15

Name

This was used both for sight word teaching in Phase II (Reading) and for matching vowel sounds in words. In the first step the children printed words from the list on the board, six words the first day, adding more daily. Initially one word was presented visually and orally for the children to cover, then just orally. When the faster children were ready for a second sheet, the slower children were given cards with the words to match visually, and a very fluid type of grouping and informal individualization began.

a e i o u

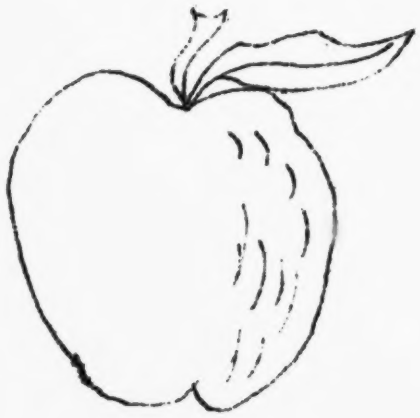
a b c d e f g h i j k l m n o p q r s t u v w x y z

a	green	ran	your	could
an	has	red	about	white
and	have	ride	again	from
are	he	said	all	had
at	help	see	am	him
away	her	show	man	his
ball	help	sleep	them	how
be	her	something	then	just
bed	here	stop	there	know
big	I	thank	they	taught
blue	in	than	this	let
call	is	that	too	many
can	it	the	us	must
cap	in	three	walk	of
car	jump	to	was	sat
come	like	two	went	saw
did	little	up	were	so
do	look	want	when	some
down	make	we	take	draw
fast	me	what	as	write
for	mother	where	back	make
get	my	will	black	show
got	no	with	boy	print
go	not	work	but	mark
good	on	yellow	came	tell
play	one	you		

This sight word list was typed in primary manuscript type and taped on the children's desks and used for constant reference.

Short Vowel Sounds

a



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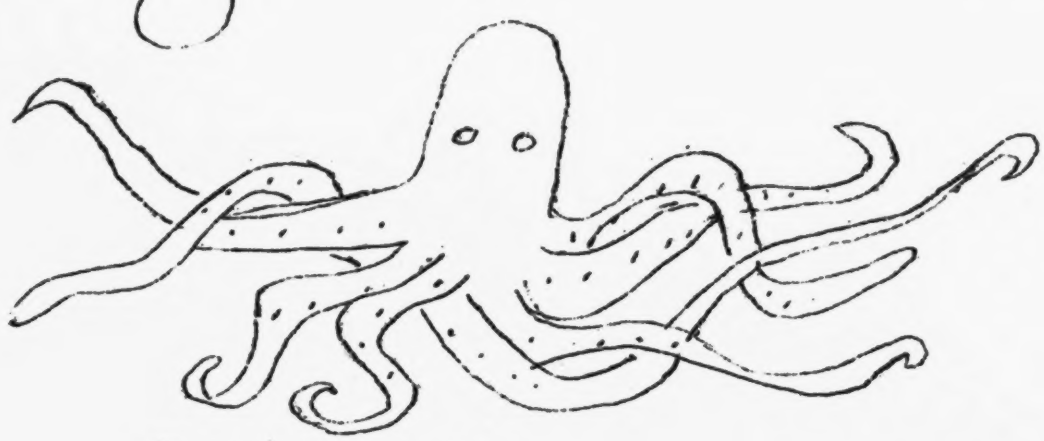

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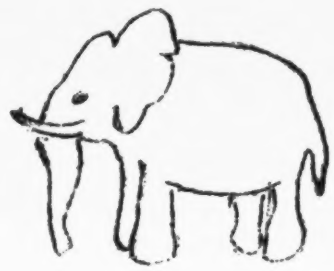

elephant
ever
egg
Ed
Grĕg

During Phase II this sheet was kept on the desk before each child so that he would have it handy for reference. All needed it at the beginning. Four quickly mastered it. The others made progress.

ABSTRACT OF REPORTING OF PROJECT S-455, OE-6-10-144

A Suggested Method For Pre-School Identification Of Potential Reading Disability

This study examined the relationships between pre-reading measures of visual-motor-perceptual skills and the reading achievement at the end of first grade. For the predictive study 14 variables were included. Five pretests were used as possible predictors. Gates Primary Word Recognition Test and California Lower Primary Reading Tests were given at the end of the school year as criteria. Complete data were gathered on 188 pupils, but 14 were drawn out for experimental purposes, leaving a sample of 172 pupils.

The Winter Haven Form Copying Test showed a correlation of .4511 with the composite reading score. Multiple correlation of the other variables failed to show significance.

The experiment to discover any significant difference in learning improvement from March to May because of visual-motor-perceptual training reached significance at the .05 level.